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IN THE CLAIMS

1. (currently amended) A packet switch device switching input packets destined for a plurality of destinations, which packets are scheduled, comprising:

a distributing unit for sequentially distributing the input packets to a plurality of paths in an arrival order, independent of destination, in units of packets;

a switch unit for switching the packets input from said distributing unit via the plurality of paths without buffers for avoiding packet confliction to the same destination, and outputting the packets in an arrival order; and

a multiplexing unit for multiplexing the packets output from said switch unit by performing a process inverse to the packet distribution process performed by said distributing unit, wherein

switching of input packets is performed by

a distribution means constituted from one or more of said distribution unit for distributing packets received at input ports in the arrival order of the packets, irrespective of destinations, to paths sequentially,

a switching means constituted from one or more of said switch unit for switching the packets to the plurality of destinations of the packets, and

a multiplexing means constituted from one or more of said multiplexing unit for multiplexing the packets according to their destinations for outputting multiplexed packets to output ports.

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2. (previously presented) A packet switch device switching input packets, which packets are scheduled, comprising:

a distributing unit for sequentially distributing the input packets to a plurality of paths in an arrival order, independent of destination, in units of packets;

a switch unit for switching the packets input from said distributing unit via the plurality of paths without buffers for avoiding packet confliction to the same destination, and outputting the packets in an arrival order; and

a multiplexing unit for multiplexing the packets output from said switch unit by performing a process inverse to the packet distribution process performed by said distributing unit, wherein:

said distributing unit multiplexes a plurality of input highway packets on a same path by assigning fixed-order time slots to the plurality of input highway packets;

said switch unit switches the plurality of packets on the same path after demultiplexing the packets for each input highway; and

said multiplexing unit multiplexes a plurality of output highway packets on a same path.

3. (previously presented) The packet switch device according to claim 1, wherein

at least one switching means is arranged, and each switching means is logically divided into a plurality of switch units, so that packets are switched.

4. (previously presented) A packet switch device switching input packets, which packets are scheduled, comprising:

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a distributing unit for sequentially distributing the input packets to a plurality of paths in an arrival order, independent of destination, in units of packets;

a switch unit for switching the packets input from said distributing unit via the plurality of paths without buffers for avoiding packet confliction to the same destination, and outputting the packets in an arrival order; and

a multiplexing unit for multiplexing the packets output from said switch unit by performing a process inverse to the packet distribution process performed by said distributing unit, wherein:

said distributing unit, said switch unit, and said multiplexing unit are prepared respectively for a plurality of lines;

when a distributing unit and a multiplexing unit, which have different numbers of accommodated lines, are arranged, a number of switch units to be multiplexed, a number of switches into which said switch unit is divided, a number of switch units to be arranged are made to match numbers required by a distributing unit and a multiplexing unit, which have a maximum number of accommodated lines, so that the distributing unit and the multiplexing unit, which have different number of accommodated lines, can be arranged.

5. (previously presented) A packet switch device switching input packets, which packets are scheduled, comprising:

a distributing unit for sequentially distributing the input packets to a plurality of paths in an arrival order in packet units;

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a switch unit for switching the packets input from said distributing unit via the plurality of paths, and outputting the packets;

a multiplexing unit for multiplexing the packets output from said switch unit by performing a process inverse to the packet distribution process performed by said distributing unit; wherein

said distributing unit, said switch unit, and said multiplexing unit include

an offset adding unit adding a predetermined different value for each input highway in sequential order to a tag which indicates an output route and is possessed by an input packet,

a switch unit outputting the packet to a corresponding switch port according to the tag to which an offset value is added,

a selector unit making a correspondence between a switch port to an arbitrary highway, and

a highway multiplexing unit multiplexing a plurality of highways for one output port.

6. (previously presented) A packet switch device switching input packets, which packets are scheduled comprising:

a distributing unit for sequentially distributing the input packets to a plurality of paths in an arrival order in units of packets;

a switch unit for switching the packets input from said distributing unit via the plurality of paths, and outputting the packets;

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a multiplexing unit for multiplexing the packets output from said switch unit by performing a process inverse to the packet distribution process performed by said distributing unit; and

an input buffer unit temporarily storing a packet on an input side of the packet switch, wherein

when said switch unit is expanded, said distributing unit, said multiplexing unit, and said switch unit are expanded, and operations of said distributing unit, said multiplexing unit, and said switch unit are changed after a packet output of said input buffer unit is once suspended, and the packet output of said input buffer unit is resumed, so that the switch unit can be expanded online.

7. (original) The packet switch device according to claim 6, wherein

whether a packet is either discarded or buffered in said input buffer unit can be selected depending on a characteristic of the packet that arrives while the packet output of said input buffer is suspended.

8. (original) The packet switch device according to claim 6, wherein:

said distributing unit, said multiplexing unit, and said switch unit comprise a register unit for setting an output route of a packet; and

said register unit comprises a plurality of registers holding values that are possibly used.

9. (original) The packet switch device according to claim 6, wherein:

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said distributing unit, said multiplexing unit, and said switch unit comprise a register unit for setting an output route of a packet; and

said register unit comprises a first register holding a currently used value, and a second register for setting a value used after an operation change is set.

10. (previously presented) A switch in a packet switch device making switching in units of packets, comprising:

an offset adding unit for adding a predetermined different value for each input highway in sequential order to a tag which indicates an output route and is possessed by an input packet;

a switch unit for outputting the packet to a corresponding switch port according to the tag to which an offset value is added;

a selector unit for making a correspondence between a switch port to an arbitrary highway; and

a highway multiplexing unit for multiplexing a plurality of highways for one output port.

11. (currently amended) A packet switching method switching input packets destined for a plurality of destinations, which packets are scheduled comprising:

sequentially distributing the input packets to a plurality of paths in an arrival order, independent of destination in units of packets;

switching the packets input in the distributing step via the plurality of paths without buffers for avoiding packet confliction to the same destination, and outputting the packets in an arrival order; and

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multiplexing the packets output in the switching step by performing a process inverse to the packet distribution process in the distributing step, wherein

switching of input packets is performed by

distributing packets received at input ports in the arrival order of the packets, irrespective of destinations, to paths sequentially,

switching the packets to the plurality of destinations of the packets, and

multiplexing the packets according to their destinations for outputting multiplexed packets to output ports.

12. (previously presented) A packet switching method switching input packets, which packets are scheduled comprising:

sequentially distributing the input packets to a plurality of paths in an arrival order, independent of destination in units of packets;

switching the packets input in the distributing step via the plurality of paths without buffers for avoiding packet confliction to the same destination, and outputting the packets in an arrival order; and

multiplexing the packets output in the switching step by performing a process inverse to the packet distribution process in the distributing step, wherein:

the distributing step multiplexes a plurality of input highway packets on a same path by assigning fixed-order time slots to a plurality of input highway packets;

the switch step switches the plurality of packets on the same path after demultiplexing the plurality of packets on the same path; and

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the multiplexing step multiplexes a plurality of output highway packets on a same path.

13. (previously presented) A packet switching method switching input packets, which packets are scheduled comprising the steps of:

sequentially distributing the input packets to a plurality of paths in an arrival order in units of packets;

switching the packets input in the distributing step via the plurality of paths, and outputting the packets;

multiplexing the packets output in the switching step by performing a process inverse to the packet distribution process in the distributing step;

adding a predetermined different value for each input highway in sequential order to a tag which indicates an output route and is possessed by an input packet,

outputting the packet to a corresponding switch port according to the tag to which an offset value is added,

making a correspondence between a switch port to an arbitrary highway, and

multiplexing a plurality of highways for one output port.

14. (original) The packet switching method according to claim 11, further comprising providing an input buffer once storing a packet before a packet is processed in the distributing step.

15. (original) The packet switching method according to claim 14, wherein

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after a packet output in the input buffer step is suspended, units used in the distributing step, the switch step, and the multiplexing step are expanded, and the packet output in the input buffer step is resumed upon completion of expansion.

16. (original) The packet switching method according to claim 15, wherein whether a packet is either discarded or buffered in the input buffer step can be selected depending on a characteristic of the packet that arrives while the packet output in the input buffer step is suspended.

17. (previously presented) A switching method for use in a packet switch device making switching in units of packets, comprising:

adding a predetermined different value for each input highway in sequential order to a tag which indicates an output route and is possessed by an input packet;

outputting the packet to a corresponding switch port according to the tag to which an offset value is added;

making a correspondence between a switch port to an arbitrary highway; and

multiplexing a plurality of highways for one output port.

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